ATTACHMENT 2

Estimate of Water Availability to Accompany Water Right Application of Soper-Wheeler Company (Hedgepeth Lake)

California Water Code Section 1260(k) requires that every application for a permit to appropriate water shall include "sufficient information to demonstrate a reasonable likelihood that unappropriated water is available for the proposed appropriation." This narrative and accompanying calculations provide the required information.

The subject Application includes a point of diversion (POD #1) on an unnamed stream in Sonoma County tributary to Pepperwood Creek thence House Creek thence Wheatfield Fork Gualala River thence South Fork Gualala River thence Gualala River (see attached map). Diversion of up to 603 acre-feet is proposed for storage at Hedgepeth Lake at POD #1. According to State Water Resources Control Board Order WR 98-08, there is no fully appropriated limitation on the subject watershed. The Application proposes a diversion season of October 1 to May 31, which conforms to Order WR 98-08. The following describes the methodology used to demonstrate a *reasonable* likelihood that water is physically available for the proposed appropriation.

The attached map shows the proposed point of diversion and the watershed area tributary thereto. The map also shows lines of equal mean annual runoff as shown on the map included with the document entitled *Mean Annual Runoff in the San Francisco Bay Region, California, 1931-70 by S.E. Rantz, 1974.*[1] An excerpt of this map is attached (Rantz map).

The weighted mean annual runoff for the watershed tributary to POD #1 was computed based on the Rantz map. Mean *seasonal* runoff for the subject watershed was estimated by adjusting the mean annual runoff assuming that the ratio of seasonal to annual runoff is identical to the ratio of seasonal to mean annual precipitation. The Skaggs Springs Las Loma precipitation station was used for this purpose (record attached). The resulting seasonal runoff value was adjusted by deducting the *face value* of any senior water rights in the watershed above the proposed point of diversion.

Calculations for the foregoing methodology are attached. These calculations show that in an average water year approximately 941 acre-feet would accrue to POD #1 (after deducting the face value of upstream water rights). This amount would be ample to fill the 603 acre-foot reservoir at POD #1, leaving about 338 acre-feet of runoff remaining. Accordingly, it is reasonable to conclude that water is available for the subject Application.

---

[1] USGS Miscellaneous Field Studies Map MF-613, prepared in cooperation with the California Department of Water Resources.

SOWHP021.doc

Water Right Application
by Soper-Wheeler Company (Hedgepeth Lake)
Estimate of Water Availability

Monthly Precipitation[1]

SKAGGS SPRINGS LAS LOMA, CALIFORNIA

Month	Mean Precipitation (in)
October	3.98
November	7.62
December	11.72
January	13.81
February	9.98
March	7.65
April	4.23
May	1.45
June	0.54
July	0.09
August	0.26
September	0.45
Annual	**61.78**

Point of Diversion #1

Mean Precipitation for requested diversion season (10/1 - 5/31):	60.44 in
Precipitation during requested diversion season as a percentage of total precipitation:	97.83%
Mean Annual Runoff:[2]	36.7 in
Estimated Mean Seasonal Runoff:[3]	35.9 in
Watershed Area for POD #1:	314.6 ac
Total Estimated Mean Seasonal Runoff at POD #1:	941.2 ac-ft
Senior Diverters of Record within POD #1 watershed (face value):	0.0 ac-ft
Total water available at POD #1:	941.2 ac-ft
Requested diversion amount:	603.0 ac-ft
Total Seasonal Amount Remaining in Stream After Diversion:	338.2 ac-ft

Notes:

[1] Source: Western Regional Climate Center website, http://www.wrcc.dri.edu/summary/climsmnca.html

[2] *Mean Annual Runoff in the San Francisco Bay Region, California, 1931-70 (Miscellaneous Field Studies Map MF-613)*, by S.E. Rantz, 1974.

[3] Estimated mean seasonal runoff is computed by multiplying mean annual runoff by percent seasonal precipitation.

SKAGGS SPRINGS LAS LOMA, CALIFORNIA

Monthly Total Precipitation (inches)

-48272

File last updated on Apr 5, 2010

*** Note *** Provisional Data *** After Year/Month 197801

a = 1 day missing, b = 2 days missing, c = 3 days, ..etc..,

z = 26 or more days missing, A = Accumulations present

Long-term means based on columns; thus, the monthly row may not sum (or average) to the long-term annual value.

MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5

Individual Months not used for annual or monthly statistics if more than 5 days are missing.

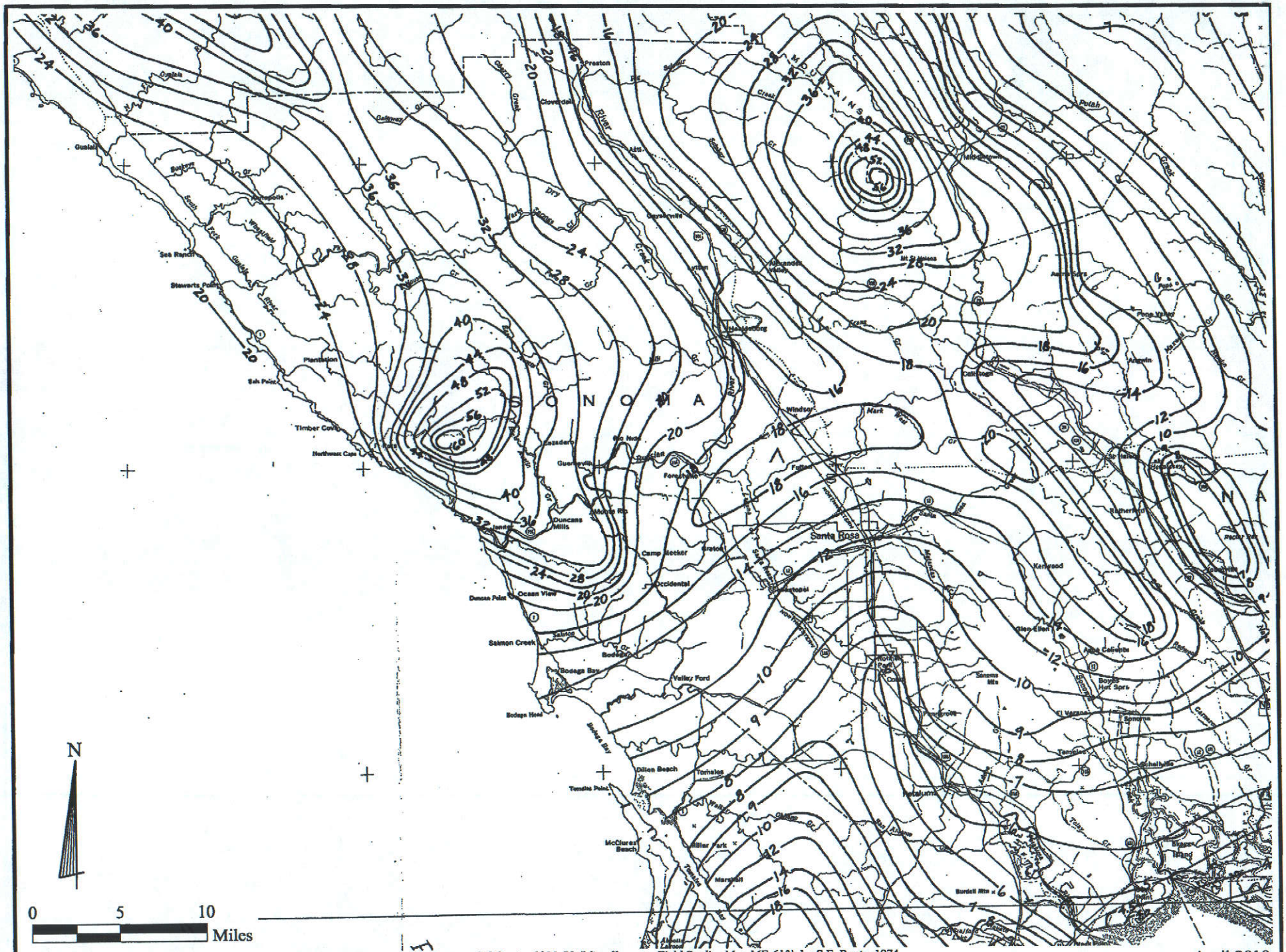
Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

YEAR(S)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
1939	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	10.44 p	1.3 z	11.75	11.75
1940	20.91	24.95	9.76	1.76 r	2.97	0.4 z	0	0	0.7	2.74	4.28	25.54	91.85
1941	17.75	19.67	13.25	8.64	4.35	2.07	0	0.1	0.44	2.08	6.41	22.67	97.43
1942	12.61	12.33	5.98	11.09	4.13	0	0	0	0.15	1.36	10.44	10	68.09
1943	13.42	4.42	6.82	4.25	1.17	1.51	0	0	0 z	2.64	2.94	3.84	41.01
1944	11.48	7.93	4.61	5.48	1.73	1.36	0	0	0.04	5.57	9.91	7.67	55.78
1945	2.85	9.23	7.2	0.84	2.74	0	0	0	0.02	12.31	9.14	24.15	68.48
1946	3.49	6.16	3.64 a	0.34 a	0.64	0.06	0.15	0	0.2	0.51	10.33	4.85	30.37
1947	1.52	6.19	10.67	1.15	0.92	2.97	0	0	0	8.66	1.9 a	3.49	37.47
1948	0 z	0 z	0 z	0 z	0 z	0 z	0.13	0.02	0.35	1.57	3.57	9.91	15.55
1949	3.41	7.8	18.13 a	0.21	0.98	0.08	0 b	0.24	0	0.18	2.77	4.31	38.11
1950	15.95	7.02 c	6.42	2.1	1.04	0.32	0	0	0	10.26	9.85	12.38	65.34
1951	10.78	7.35	4.29	1.56	3.46	0	0 b	0.02	0.07	4.45	10.02	18.09	60.09
1952	15.69	7.68	6.98	1.55	1.38	1.66	0	0	0.04	0.19	4.1	23.46 a	62.73
1953	15.75	0.28	7.25	4.84	1.49	0.8	0	0.28	0	2.64	12.27	3.59	49.19
1954	15.09	6.58	9.59	6.72	0.1	1.38	0	3.2	0.19	1.85	10.39	11.64	66.73
1955	7.27	2.57	1.53	9.72	0	0.09	0	0	0.68	1.46	5.57	37.33	66.22
1956	22.35	0.83 j	1.25	4.3	1.62	0.11	0.06	0	0.12	7.42	0.5	1.07	38.8
1957	12.55	14.48	9.08	4.51	8.97	0.04	0	0	5.23	10.89	3.77	9.36	78.88
1958	14.29 a	34.24	10.68	9.56	0.18	1.39	0.8	0	0 z	0.55	1.67	2.53	75.89
1959	19.79	18.32	3.52	1.17	0.21	0	0	0.03	0.05 h	0.07	0.2	3.35	46.66
1960	14.89	17.68	11.51	3.09	1.7	0	0	0	0	1.85	10.23	14.01	74.96
1961	8.44	7.31	9.81	2.75	1.4	0.1	0	0.06	0.27	2.05	1.36 j	7.57	39.76
1962	4.73	19.45	10.09	1.5	0.61	0	0	0.59	0.56	15.42	2.75	7.95	63.65
1963	9.09	9.71	9.72	12.58	2.42	0.02	0	0	0.04	6.34	14.69	1.74	66.35
1964	11.11	0.33	3.64	0.48	1.96	0.87	0	0	0	6.65	14.18	27.32	66.54
1965	15.75	2.62	3.81	11.42	0	0.05	0.02	0.6	0	0.35	17.16	0 z	51.78
1966	14.91	9.86	3.96	2.44	0.59	0.07	0	1.38	0.2	0	16.78	10.97	61.16
1967	22.96	0.65	10.63	8.04	0.44	2.38	0	0	0.1	2.64	5.2	8.67	61.71
1968	0 z	9.22	7.07	1.05	1.26	0	0	2	0.2	3.82	4.64	18.43	47.69
1969	24	17.93	2.69	4.85	0.29	0.03	0	0	0	3.73	3.2	22.06	78.78
1970	36.83	6.11	4.54	0.83	0.2	0.62	0	0	0	3.98	14.31	18.53	85.95
1971	9.18	0.57	10.52	2.97	0.73	0.02	0	0.3	0.59	0.91	6.16	11.17	43.12
1972	4.84	6.02	2.63	4.27	0.42	0.2	0	0.26	1.99	5.48	10.64	7.15	43.9
1973	25.39	15.36	6.14	0.44	0.34	0	0	0.1	2.32	5.78	24.98	12.34	93.19
1974	14.26	7.39	18.33	5.11	0.1	0	1.78	0 z	0	2.01	2.91	10.12	62.01
1975	3.65	17.98	16.06	4	0.37	0.09	0.25	0.07	0	8.14	3.16	3.49	57.26
1976	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0.77	0.67	3.31	1.1	5.85
1977	0 z	4.04	3.65	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	7.69
1978	26.49	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	26.49
Period of Record Statistics													
MEAN	13.81	9.98	7.65	4.23	1.45	0.54	0.09	0.26	0.45	3.98	7.62	11.72	63.13
S.D.	7.86	7.59	4.35	3.55	1.74	0.81	0.32	0.66	0.99	3.81	5.59	8.64	16.45
SKEW	0.63	1.13	0.75	0.87	2.57	1.49	4.49	3.3	3.69	1.22	0.98	0.97	0.03
MAX	36.83	34.24	18.33	12.58	8.97	2.97	1.78	3.2	5.23	15.42	24.98	37.33	97.43
MIN	1.52	0.28	1.25	0.21	0	0	0	0	0	0	0.2	1.07	30.37
NO YRS	35	35	36	34	35	34	36	35	34	37	36	37	26

Soper-Wheeler Company (Hedgepeth Lake)
Calculation of Weighted Mean Annual Runoff in POD Watersheds

Watershed	Area (ac)	Mean Annual Runoff [1] (in)	Volume (ac-in)	Volume (ac-ft)
POD #1	315	36.7	11,538	962

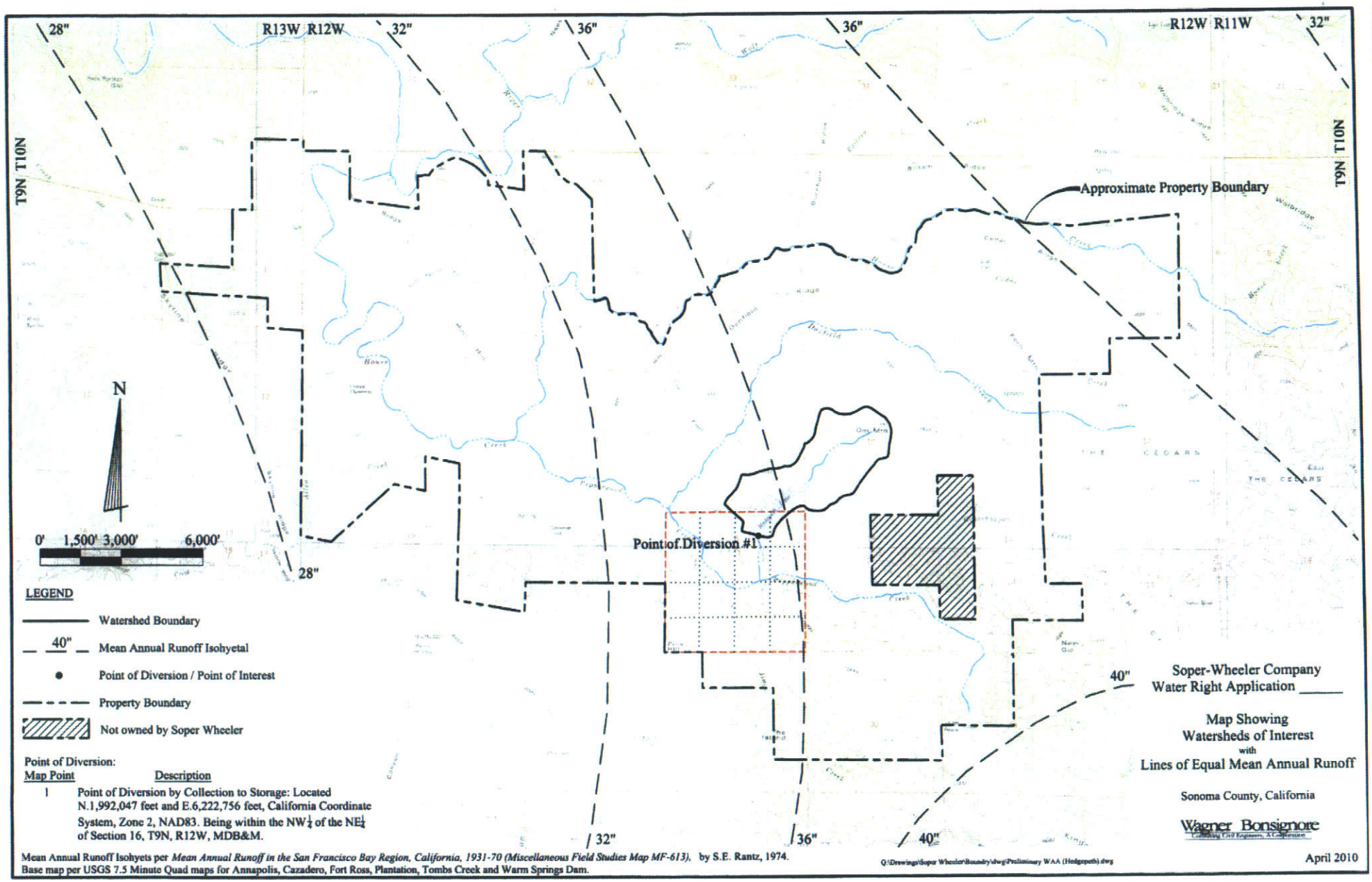
Notes:
1. Weighted mean annual runoff from automatic calculation using AutoCAD.



Mean Annual Runoff Isohyet's per *Mean Annual Runoff in the San Francisco Bay Region, California, 1931-70 (Miscellaneous Field Studies Map MF-613)*, by S.E. Rantz, 1974.

Q:\Drawings\Soper Wheeler\Boundry\dwg\Preliminary WAA (Hedgepeth).dwg

April 2010


28"
R13W R12W
32"
36"
36"
R12W R11W
32"
T9N T10N
T9N T11N
Approximate Property Boundary
N
0' 1,500' 3,000' 6,000'
28"
Point of Diversion #1
32"
36"
40"
40"
LEGEND
Watershed Boundary
40" Mean Annual Runoff Isohyetal
Point of Diversion / Point of Interest
Property Boundary
Not owned by Soper Wheeler
Point of Diversion:
Map Point Description
1 Point of Diversion by Collection to Storage: Located N.1,992,047 feet and E.6,222,756 feet, California Coordinate System, Zone 2, NAD83. Being within the NW¼ of the NE¼ of Section 16, T9N, R12W, MDB&M.
Soper-Wheeler Company
Water Right Application ____
Map Showing
Watersheds of Interest
with
Lines of Equal Mean Annual Runoff
Sonoma County, California
Wagner Bonsignore
Consulting Civil Engineers, A Corporation
Mean Annual Runoff Isohyets per Mean Annual Runoff in the San Francisco Bay Region, California, 1931-70 (Miscellaneous Field Studies Map MF-613). by S.E. Rantz, 1974.
Base map per USGS 7.5 Minute Quad maps for Annapolis, Cazadero, Fort Ross, Plantation, Tombs Creek and Warm Springs Dam.
Q:\Drawings\Soper Wheeler\Boundry\dwg\Preliminary WAA (Hedgepeth).dwg
April 2010